WHAT IS CLAIMED IS:

1. An electric rotating machine comprising:

a U-phase coil constructed in a manner such that Un partial coils (U1, U2, U3, ···) which are n ($n \geq 3$) in number are connected in series to each other, with one end of said U-phase coil being connected to an input/output terminal;

a V-phase coil constructed in a manner such that Vn partial coils (V1, V2, V3, ···) which are n ($n \geq 3$) in number are connected in series to each other, with one end of said V-phase coil being connected to an input/output terminal;

a W-phase coil constructed in a manner such that Wn partial coils (W1, W2, W3, ···) which are n ($n \geq 3$) in number are connected in series to each other, with one end of said W-phase coil being connected to an input/output terminal;

a ring-like stator core having a plurality of slot group sets formed in its circumferential directions, each including a U-phase slot group, a V-phase slot group and a W-phase slot group arranged continuously, said U-phase slot group for accommodating said n ($n \geq 3$) Un partial coils formed in a state adjacent to each other in said circumferential directions, said V-phase slot group for accommodating said n ($n \geq 3$) Vn partial coils formed in a state adjacent to each other in said circumferential directions, and said W-phase slot group for accommodating said n ($n \geq 3$) Wn partial coils formed in a state adjacent to each other in said circumferential directions;

a stator winding to which the other ends of said U-phase coil, said V-phase coil and W-phase coil are connected; and

a rotor having a plurality of magnetic poles formed along said circumferential directions,

wherein each of said Un partial coils (U1, U2, U3, ···) includes a circling coil composed of Un inside-slot conductor portions accommodated in the corresponding U-phase slot group and outside-slot conductor portions for making connections between said Un inside-slot conductor portions in the exterior of the U-phase slot group, with said circling coil of said Un partial coil approximately

circling said stator core in said circumferential directions, and each of said Vn partial coils (V1, V2, V3, ···) includes a circling coil composed of Vn inside-slot conductor portions accommodated in the corresponding V-phase slot group and outside-slot conductor portions for making connections between said Vn inside-slot conductor portions in the exterior of the V-phase slot group, with said circling coil of said Vn partial coil approximately circling said stator core in said circumferential directions, and each of said Wn partial coils (W1, W2, W3, ···) includes a circling coil composed of Wn inside-slot conductor portions accommodated in the corresponding W-phase slot group and outside-slot conductor portions for making connections between said Wn inside-slot conductor portions in the exterior of the W-phase slot group, with said circling coil of said Wn partial coil approximately circling said stator core in said circumferential directions, and said inside-slot conductor portions of each of said partial coils to be connected to said input/output terminals are accommodated in slots other than slots existing at end portions of each of said U-phase slot group, said V-phase slot group and said W-phase slot group in said circumferential directions.

2. The machine according to claim 1, wherein, of each of said Un partial coils, said Vn partial coils and said Wn partial coils, said inside-slot conductor portions of a partial coil connected to a neutral point are accommodated in slots existing at an end portion of each of said U-phase slot group, said V-phase slot group and said W-phase slot group in said circumferential directions.

3. The machine according to claim 1, wherein a slot of each of said slot groups is made to accommodate a plurality of inside-slot conductor portions of said inside-slot conductor portions in radial directions of said stator core,

each of said circling coils is composed of a plurality of U-shaped segments, connected to each other, each having an outside-slot conductor portion of said

outside-slot conductor portions and a pair of inside-slot conductor portions of said inside-slot conductor portions,

said outside-slot conductor portion includes a U-shaped head portion protruding from one end side of said stator core to continue into one end portions of said pair of inside-slot conductor portions, and a pair of protruding end portions protruding from the other end side of said stator core to continue into the other end portions of said of inside-slot conductor portions and extending generally in said circumferential directions of said stator core, and

said pair of inside-slot conductor portions are accommodated in a slot of an in-phase slot group of said slot groups at the same position in said circumferential directions and at different positions in said slot in said radial directions.

4. The machine according to claim 2, wherein, in each of said U-phase coil, said V-phase coil and said W-phase coil, said inside-slot conductor portions of a different partial coil are accommodated between said inside-slot conductor portions of said partial coil connected to said neutral point and said inside-slot conductor portions of said partial coil connected to said input/output terminal in each of the single U-phase slot group, the single V-phase slot group and the single W-phase slot group.

5. The machine according to claim 1, wherein, in each of said U-phase coil, said V-phase coil and said W-phase coil, said inside-slot conductor portions of said partial coil connected to said input/output terminal are accommodated at a central position in each of the single U-phase slot group, the single V-phase slot group and the single W-phase slot group, and said partial coil connected to a neutral point are accommodated at an end position therein, and said inside-slot conductor portions closer to said partial coil connected to said neutral point are

accommodated at positions closer to an end portion of each of the single U-phase slot group, the single V-phase slot group and the single W-phase slot group.

6. The machine according to claim 3, wherein said head portions of said U-shaped segments are arranged in said slots of the stator core in said radial directions and are inclined with respect to an axial direction of said stator core so that the degree of the inclination of each of said U-shaped segments increases as said U-shaped segments are positioned more outwardly in said radial directions.

7. The machine according to claim 1, wherein said Un partial coils, said Vn partial coils and said Wn partial coils, extending in said radial directions, are concentrically arranged in parallel with each other.

8. An electric rotating machine comprising:

a ring-like stator core having a plurality of slot group sets formed in its circumferential directions, each continuously including:

a first phase slot group composed of n ($n \geq 3$) first slots formed in a state adjacent to each other in said circumferential directions; and

a second phase slot group composed of n ($n \geq 3$) second slots formed in a state adjacent to each other in said circumferential directions;

a stator winding including:

a first phase coil made by connecting n ($n \geq 3$) first partial coils in series to each other, with one end of said first phase coil being connected to an input/output terminal; and

a second phase coil made by connecting n ($n \geq 3$) second partial coils in series to each other, with one end of said second phase coil being connected to an input/output terminal, the other ends of said first phase coil and said second phase coil being connected to each other; and

a rotor having a plurality of magnetic poles in its circumferential directions,

wherein each of said first partial coils includes a circling coil accommodated in the corresponding first slots and composed of first inside-slot conductor portions and outside-slot conductor portions for making connections between said first inside-slot conductor portions in the exterior of said slot group sets, with said circling coil approximately circling said stator core in said circumferential directions, and each of said second partial coils includes a circling coil accommodated in the corresponding second slots and composed of second inside-slot conductor portions and outside-slot conductor portions for making connections between said second inside-slot conductor portions in the exterior of said slot group sets, with said circling coil approximately circling said stator core in said circumferential directions, and said inside-slot conductor portions of each of said partial coils to be connected to said input/output terminal are accommodated in slots other than slots existing at end portions of each of said first and second phase slot groups in said circumferential directions.

9. An electric rotating machine comprising:

a stator core including phase slot groups each composed of a plurality of slots and made along its inner circumferential surface in its circumferential directions; and

a stator coil including a plurality of phase coils each made by connecting a plurality of segments each composed of inside-slot conductor portions to be accommodated in said slots and outside-slot conductor portions protruding from said slots,

wherein each of said phase coils is formed by connecting a plurality of concentric circling coils, each generally circling said stator core along said inner circumferential surface, and said inside-slot conductor portions of said segment constituting, of said plurality of circling coils, said circling coil which has an

external leader terminal are accommodated in, of said plurality of slots constituting each of said phase slot groups, said slot which does not adjoin said slot group different in phase, and an insulating member is interposed between said outside-slot portions adjacent to each other in a radial direction of said stator core.

10. The machine according to claim 9, wherein said segement has a U-like configuration and said plurality of outside-slot conductor portions are disposed into a lattice-like configuration to intersect each other in an axial exterior of an axial end portion of said stator core, and the intersections between said outside-slot conductor portions are arranged in n rows in an axial direction from said axial end portion, and said insulating member is placed at the intersection positions going beyond a first row of said n rows.

11. The machine according to claim 9, wherein said segement has a U-like configuration and said plurality of outside-slot conductor portions are disposed into a lattice-like configuration to intersect each other in an axial exterior of an axial end portion of said stator core, and the intersections between said outside-slot conductor portions are arranged in n rows in an axial direction from said axial end portion, and said insulating member is interposed at the intersection positions short of an n-th row of said n rows.

12. An electric rotating machine comprising:

a stator core including a plurality of slots disposed along its inner circumferential surface; and

a stator coil including a plurality of concentric circling coils each made in a manner such that a plurality of U-shaped segments each composed of inside-slot conductor portions to be accommodated in said slots and outside-slot conductor portions protruding from said slots are connected to each other along said inner circumferential surface of said stator core to approximately circle said inner circumferential surface thereof,

wherein an insulating member is previously interposed between, of said outside-slot conductor portions adjacent to each other in radial directions of said stator core, said outside-slot conductor portions having the relationship in which said outer circumferential side outside-slot conductor portion is disposed in a state inclined in a radial and outward direction and in a circumferential direction of said stator core with respect to an inner circumferential side protruding end portion to suppress sliding contact therebetween when said inner circumferential side outside-slot conductor portion is inclined in said radial and outward direction and in said circumferential direction.